

Alternate Geotextile Fabric Placement Method

PREPARED FOR: de maximis, inc.
COPY TO: File
PREPARED BY: CH2M HILL
DATE: January 20, 2014
PROJECT NUMBER: 474468.RA.PM.01

Introduction

This technical memorandum is provided, supplemental to the Great Lakes Dock and Dredge (GLDD) Capping Plan, to demonstrate that the proposed alternate means and methods for installing the geotextile/armor layer of the RM 10.9 cap will meet the requirements of the specifications. Following installation of the sand/AquaGate+PAC™ (active) layer, a single layer of an approved non-woven 100% plastic high strength dimensionally stable geotextile is installed. Tidal and current conditions of the Lower Passaic River have made the placement of the geotextile difficult and as a result GLDD developed two alternate placement methods. The primary method will be the use of a sinking bar configuration that rolls the geotextile out perpendicular to shore. The contingent (secondary) method uses a structural frame to place the geotextile fabric into position as overlapping panels.

The sinking bar configuration meets all of the requirements of Section 02 32 00 of the technical specifications. However, the structural panel method does not meet two (2) of the requirements of the technical specifications. The purpose of this technical memorandum is to demonstrate that the alternate geotextile placement method meets the intent of Section 02 32 00 Capping and will not adversely impact the protectiveness of the cap.

Structural Panel Placement Method

With this method a structural frame will be constructed to hold the geotextile fabric in position. The 75 foot x 30 foot structural frame will be constructed with 10-inch pipe and the geotextile panel will be secured within the frame with a low strength twine that will easily break when the frame is removed.

The frame with the geotextile attached will be lowered into position on top of the Sand/AquaGate layer and armor stone then added to ballast and anchor the geotextile fabric in position. Once the geotextile fabric has received the required 6-inch (Modified Cap) or 12-inch (Design Cap) thick armor stone layer the frame will be pulled up and the geotextile fabric and armor stone remains in place. The anticipated configuration of the structural frame placement method is shown in Figure 1.

This placement method will improve control of the geotextile overlap as the structural frame will provide positive position control of the geotextile fabric. In addition, the location of two corners of the frame would be recorded using GPS to verify overlap of the subsequent geotextile panels. The minimum overlap between upstream and downstream panels will be 18-inches as specified. However, since the geotextile will not be placed as continuous rolls, and will be placed with as a single panel, the sewing of overlaps per paragraph 3.03G of Section 00 32 00 (*3.03 Geotextile Placement - G. "End-of-panel overlaps shall be sewn, stapled or hog-ringed along each side of a 1 foot overlap."*) will not be possible. Therefore, to allow for the geotextile to be overlapped longitudinally, the last three (3) feet of the exposed edge of the panel will not have armor placed upon it until the subsequent panel has been positioned. This will allow for the geotextile from the adjacent panel to lay on top of the geotextile from the first panel, prior to the armor stone being placed, with a minimum three foot overlap.

GPS will be used to align the edge of the geotextile placement barge as well as assist in positioning of the structural frame. Final positioning will be confirmed by locating the corners of the frame with GPS. After a panel of geotextile has been properly placed, the geotextile barge will be moved to the next frame position and the next panel will be placed.

The structural panel method may also result in the placement of the geotextile fabric parallel rather than perpendicular to the shoreline as specified in Paragraph 3.03B of Section 02 32 00 (*3.03 Geotextile Placement - B. "Orient geotextile with long (unrolled) direction perpendicular to shoreline."*). The perpendicular placement requirement was included in order to be able to confirm the 18 inch overlap between geotextile panels when using the rolls of geotextile material (i.e. sinking bar assembly alternative). Parallel placement using the sinking bar method would require the use of divers in order to confirm the 18 inch overlap. However, since the structural frame method utilizes positioning software to confirm the location of each panel during placement, the orientation of the panel to the shoreline (i.e. parallel versus perpendicular) is not considered critical.

Figures 2 and 3 show the 29 ft x 75 ft geotextile panels, orientated perpendicular and parallel to the shoreline, respectively.

Conclusions and Recommendations

The proposed alternate structural frame placement method for geotextile fabric meets the intent of overlap requirements of the technical specifications and would not adversely impact the performance of the cap. The panels will be placed with the minimum required overlap using the structural frame method ensuring complete coverage. Therefore, the structural frame placement method is considered acceptable for use on the RM10.9 project.

Figure 8: Structural Frame Geotextile Deployment Method

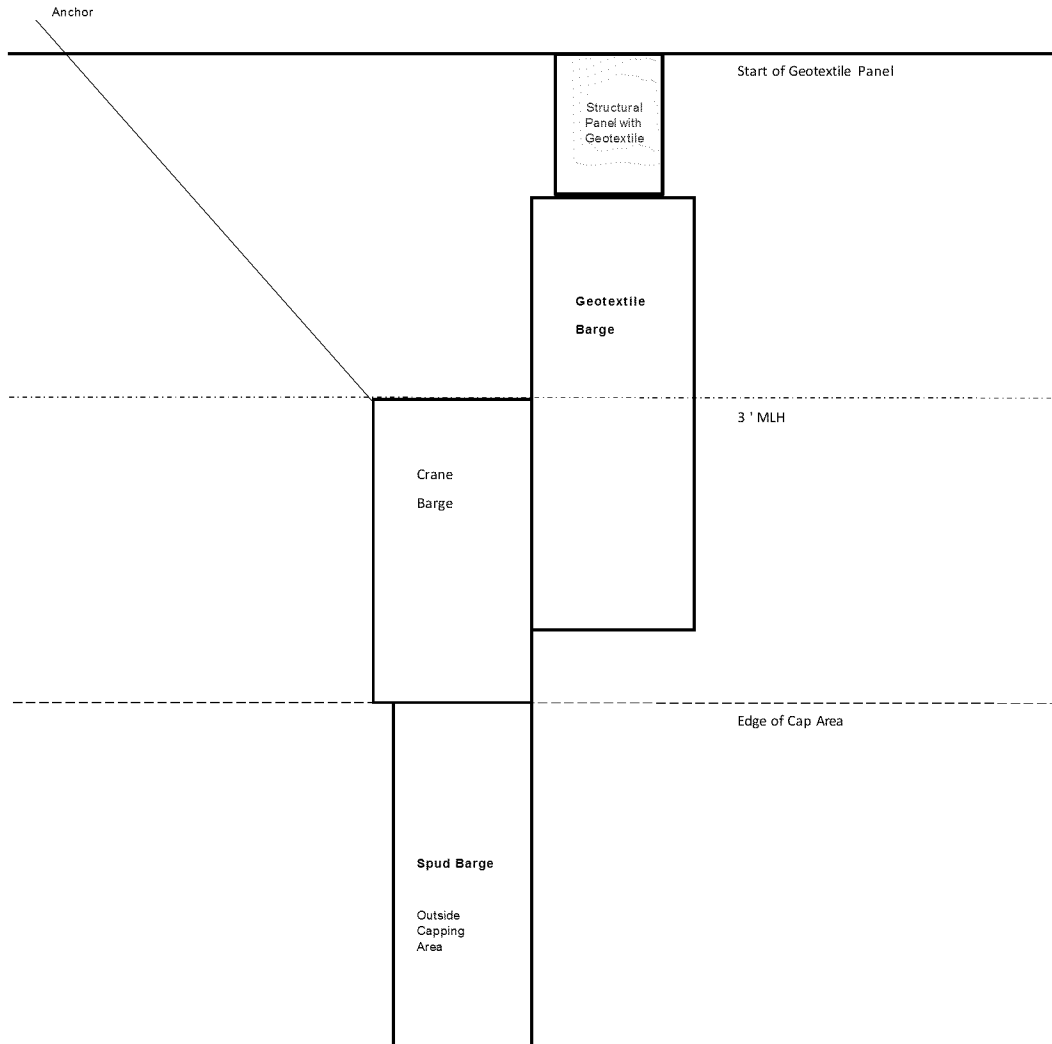


Figure 1 – Structural Frame Placement Method Configuration

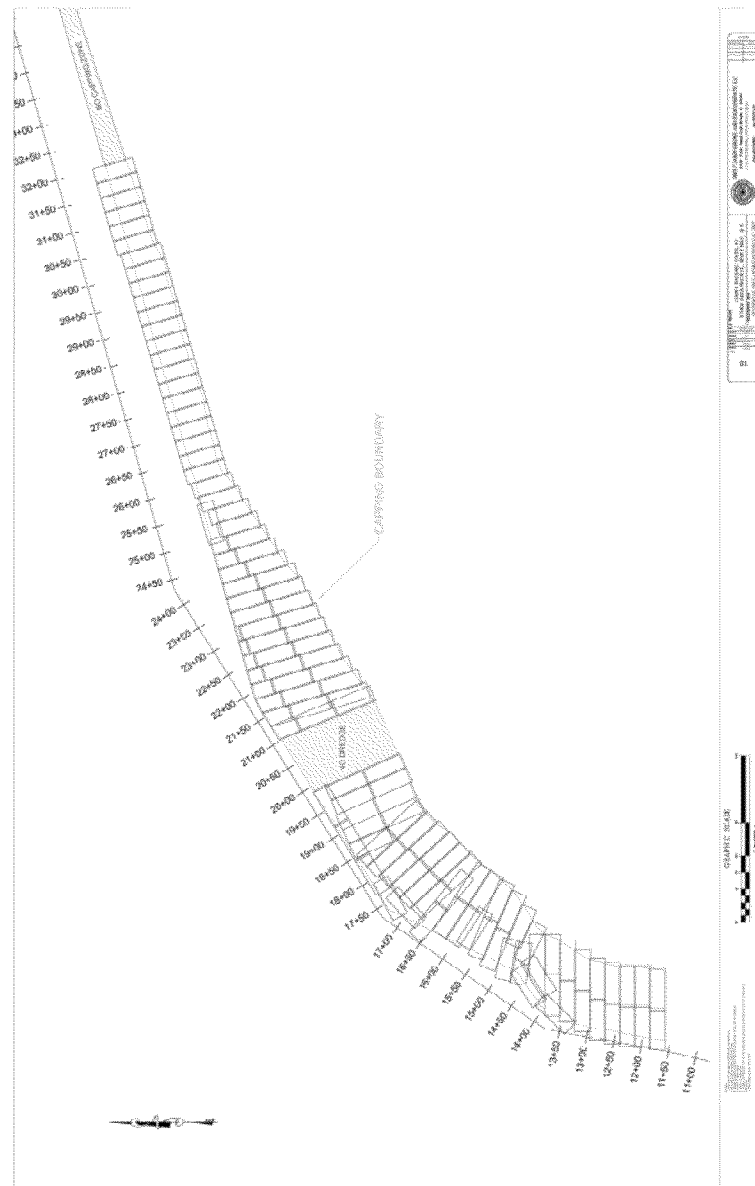


Figure 2 - Panel Layout Using 29 ft x 75 ft Panels, Orientated Perpendicular to Shore

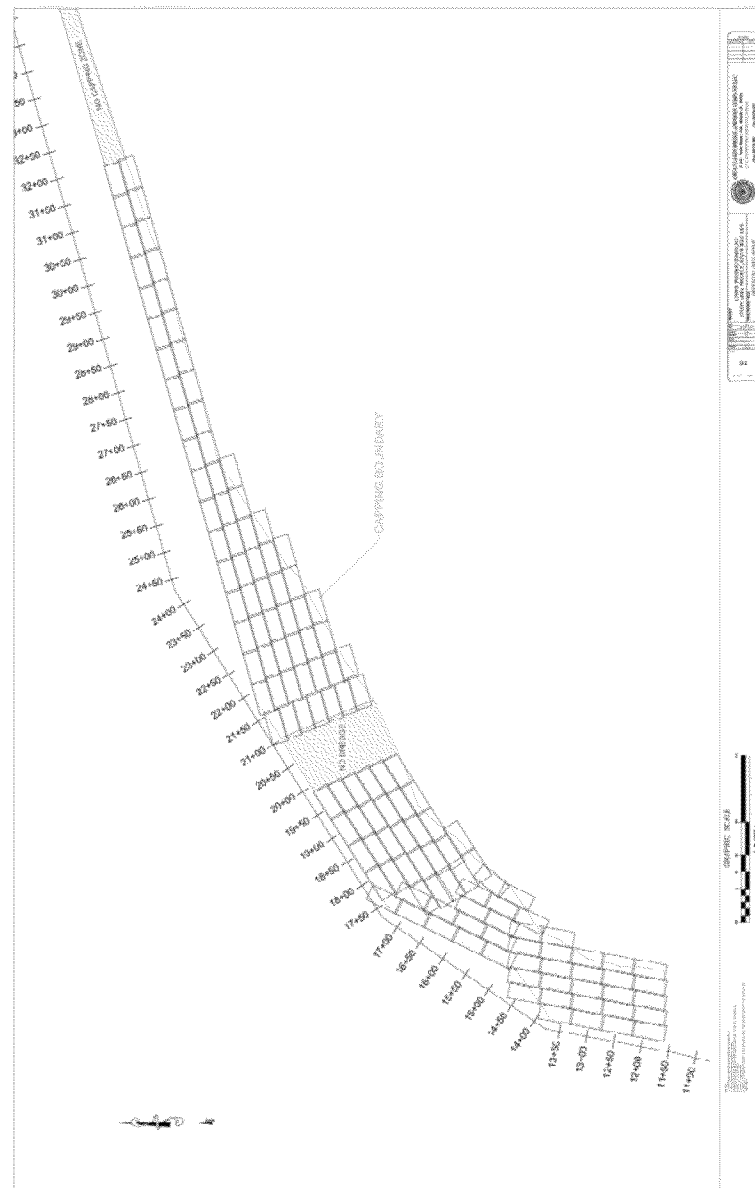


Figure 3 - Panel Layout Using 29 ft x 75 ft Panels, Orientated Parallel to Shore